DRAFT
Technical Issues Committee
Meeting Notes
23 July 2007

Attendees:
Dan Odenweller, Central Valley Water Board
Karl Longley, Central Valley Water Board
Stephen Clark, Pacific EcoRisk
Marshall Lee, California Department of Pesticide Regulation
Susan Fregien, Central Valley Water Board
Dania Huggins, Central Valley Water Board
Tina Lunt, Sacramento Valley Water Quality Coalition
Claus Suverkropp, Larry Walker and Associates
Roberta Firoved, California Rice Commission (CRC)
Bill Thomas, South San Joaquin Water Quality Coalition
Jim Atherstone, South San Joaquin Irrigation District
John Swanson, Central Valley Water Board
Margie Lopez Read, Central Valley Water Board
Mike Johnson, University of California at Davis
Ken Landau, Central Valley Water Board
Johnny Gonzales, State Water Resources Control Board
Al Vargas, California Department of Food and Agriculture
Keith Larson, Turlock Irrigation District
Rod Schuler, Retired, Public Works
Mike Niemi, Modesto Irrigation District
Anna Hibbert, Modesto Irrigation District
Dan Waligor, California Department of Fish and Game
Joe McGahan, Westside Coalition
Jamil Ibrahim, MWH Global
John Meek, San Joaquin County & Delta Water Quality Coalition
Joel Miller, Environmental Consulting
Elaine Archibald, Consultant
Mike Wackman, San Joaquin County & Delta Water Quality Coalition
David Bolland, Association of California Water Agencies
Rick Hoelzel, Kings River Conservation District
David Cone, Kings River Conservation District
Lisa Hunt, URS Consulting
Max Stevenson, Yolo County Flood Control & Water Conservation District
Mellanie Marshall, Surface Water Ambient Monitoring Program
Arturo Carvajal, USDA/NDCS
Val Conner, State Water Resources Control Board

Meeting Summary

I. Introductions and Announcements

The primary purpose of this Technical Issues Committee (TIC) meeting was to develop concepts and specific steps for revision of the working draft Coalition Monitoring and Reporting Plan (MRP). Dr. Brock Bernstein led discussions with meeting participants, with the goal of providing clarity and flexibility for the coalition groups to address the MRP management questions, while also maintaining a consistent, systematic monitoring approach among coalitions. This meeting focused on principles of source identification.

Dr. Bernstein introduced himself and his role in the MRP revision process. After his initial review of the draft MRP, Dr. Bernstein concluded that the draft MRP contains the major elements needed in a monitoring plan and does not need a formal written review. He stated that a lot of thought and work have clearly gone into the document. Dr. Bernstein explained that he could be of most help by providing some guidance that will accelerate the MRP revision process, provide design tools, define criteria, and provide clarity.

In preparation for this TIC meeting, Dr. Bernstein met with many of the coalition representatives to get a better understanding of the issues and concerns they have regarding the draft MRP. A common concern expressed was the need to better understand the five management questions and how to address them.

II. Key Management Questions

A handout titled *Suggested MRP Language re Management Questions* was provided to the participants. In this handout, Dr. Bernstein slightly modified the draft MRP text to emphasize that while the five questions represent a logical progression of steps, the coalitions will not necessarily need to address them in a linear fashion and may have already completed some steps. A flow chart included in the handout illustrates how the steps are interrelated and identifies logical steps based on yes-no answers to the five questions (Figure 1). Many agencies and programs utilize this type of monitoring approach, including the USGS, SWAMP, USEPA, and various storm water programs.

Meeting participants did not have any specific questions regarding the five questions on the flow chart. Bill Thomas commented that he believes that the coalitions understand the five management questions, but they are having trouble figuring out how the questions relate operationally to implementation of the MRP. Dr. Bernstein stated that he wants to address the gap that currently exists between the five questions and identification of the criteria used to answer them. He believes that the Regional Board does not want a cookie cutter plan, but does need to identify guidance to provide regional consistency.

Question No. 3 was selected as the starting point for discussion (Figure 1).

III. Source Identification

The topic of source identification is key to addressing management question No. 3. Dr. Bernstein noted that the approach to address source identification might depend on what you already know. For example, there may be certain chemicals that are specific to a particular crop or season; the coalition may not need to conduct follow-up sampling if it can establish the case that the areas of potential chemical application are known.

Dr. Bernstein stated that water quality issues would need to be prioritized so that the highest priorities can be addressed first. Coalitions should start by determining whether an identified issue is related to agriculture. Questions that need to be answered include: how do we know when to move from one BMP to another and how do we know when to move on to the next highest priority issue? Dr. Bernstein noted that the flow chart for *Weight of Evidence Ranking* uses the Level I BMPs, Level II BMPs, and Level III BMPs simply as placeholders. The coalitions will eventually identify the types of BMPs in each category.

PROPORTIONAL LEVEL OF EFFORT

Ken Landau noted that the level of response should be in proportion to the level of toxicity. For example, the response to 10 miles of dead fish in a stream would be different than a relatively small toxicity event in a small area. Dr. Bernstein asked whether Regional Board staff would entrust coalitions to make the distinction between different types of toxic events. Possibilities include: 1) entrust them to make the decision; 2) offer some clarifying structure for coalitions to work within; and 3) Not to entrust them with the decision and dictate exactly what the response should be. It is likely that the middle approach would be most acceptable to the coalitions and the Regional Board.

TIME FOR SOURCE IDENTIFICATION

Mike Wackman indicated that the coalitions want to be given a reasonable amount of time to investigate sources of exceedances. This is especially important when there are inherent constraints in the system, for example when a chemical application only takes place during a short period each year, and it may take some time to verify assumptions. Margie Read explained that the Regional Board would want to see that reasonable, timely efforts and progress are being made towards identifying sources. The Board would want to see evidence that the problems are being addressed, for example, pesticide use reports, identification of management practices, increased education and outreach. Ken Landau noted that there are many issues that would not occur on a continuous basis and the best investigation approach would need to be determined on a case-by-case basis. The MRP should be designed to address these types of temporal concerns (Dr. Bernstein). Margie Read expressed the importance of having background information that supports the flexibility for a case-by-case approach.

MISCELLANY

Mike Johnson emphasized that pesticides are not the only constituents that these discussions pertain to. The coalitions are dealing with exceedances of a variety of

constituents, such as lead and ammonia. For many such constituents, there are no use reports and it can be hard to trace them back to their source(s). Another participant suggested that other tools would be available to answer the question "is it agriculture?" question in the flow chart (Figure 1) and that it would be important to have an "out" in the source identification flowchart for non-agricultural sources.

Steven Clark asked what happens if the source cannot be clearly identified and suggested that, in such cases, there might need to be some prioritization step at the top of the flowchart. Dr. Bernstein stated that the "weight of evidence" box at the top of the Figure 1 flowchart is intended to do at least some of this prioritization because it represents the results of the assessment monitoring from management questions #1 and #2. Also, what if the sources are identified and agriculture is only 20% of the source? Dr. Bernstein suggested that coalitions might need to allocate their resources accordingly. In addition, other programs have been able to develop an "off-ramp." Thus, when coalitions have tried a variety of different alternatives, but they still have not succeeded in identification of the source, they could have another option for exiting this loop. For example, allocate 80% of effort towards issues that coalitions know are their problem and 20% towards issues that are not as clear. Mike Johnson noted that it might be necessary to rethink the original data quality objectives because it's often not possible to get data back from the labs fast enough to follow up as needed. Dr. Bernstein responded that the data quality objectives should be appropriate to the information needed and Val Conner pointed out that quick and cost efficient field studies can be conducted to help focus more comprehensive and detailed studies. For example, ammonia test kits provide the ability to quickly collect a large number of samples that would generate data extremely useful for preliminary source tracking, even though the data would not meet the highest possible level of quality in terms of detection limits.

Dan Odenweller suggested that the group choose some parameters to use as examples and go through the steps on the flow chart (Figure 2). A participant asked how this process will address exceedances of other constituents that are low priority individually, but that combined might have significant synergistic effects? Other participants suggested that such situations would have to be dealt with on a case-by-case basis and Margie Read noted that the question for the MRP is how much flexibility in terms of such instances is enough.

With regard to the need to develop solutions with appropriate timing and level of response, Dr. Bernstein stated that better source identification is needed to accomplish this. Some criteria for addressing BMPs might include:

1. Does the BMP address the problem?
2. BMPs should be based on the body of knowledge of what we know about what is already being done to address this problem, with new efforts incremental to, rather than duplicative of, existing efforts.
3. BMP options should start with the less expensive, easiest methods to implement and progress to the more expensive and complicated methods.

4. Cost and efficiency should be compared with the urgency and severity of the issue.
5. Apply the most appropriate criteria for implementing BMPs (i.e. Identify whether toxicity events are caused by agriculture) and include efforts to improve information about sources as needed.

John Meek stated that flexibility will be needed to implement these criteria and Dr. Bernstein responded that the MRP's provisions regarding special studies allow for a great deal of flexibility. Claus Suverkropp agreed with the criteria. However, he thinks that the coalitions do not have detailed information about which BMPs are being applied where. This would require detailed surveys, which have not occurred and could be very expensive to implement. Ken Landau explained that exhaustive information is not needed, just enough to know that the methods selected for implementation are not already being used. Mike Wackman agreed that the coalitions can get a general idea of what's being used and then use this knowledge to apply new practices to address problems. The coalitions' basic concern is with the level of detail the Board might require. Dr. Bernstein stated that the basic objective here is to ensure that money is not being wasted pursuing management practices (BMPs) that are either already being used or that prior experience has shown do not work. Ken Landau further explained that the Board's interest is that, for example, efforts not be spent targeting all farmers if only 5% are the source of a problem because of their practices. Mike Johnson pointed out that coalitions do not have the authority to force growers to implement BMPs, it is entirely up to the growers. Yet, there are between 15% and 40% of growers that are not enrolled in the program.

The box describing the level of implementation should be changed to "Level of Contact" (Figure 2). Another item of concern is salinity because even though the source might be agriculture, it is coming from outside coalition boundaries. Thus, the question was raised, what happens if an identified source is outside of the coalition? Ken Landau, suggested that in these kinds of situations it will be up to Regional Board staff and the appropriate parties to resolve the situation.

Bill Thomas asked how one gets out of an endless loop if source cannot be identified or the target is not attainable? Ken Landau stated that an "it's not us" clause should be added to the flow chart to avoid the endless loop, as well as possibly an offramp for low priority inputs. This raised questions such as "what if it later becomes us, after it is declared it isn't us?", "what happens if it determined to be 20% us?", and "what about legacy issues that we are not currently responsible for?" There were no ready answers to these questions.

Dr. Bernstein suggested that evaluating agriculture's relative contribution to a source might be an exercise in loadings estimation, similar to the approach used by stormwater programs. Claus Suverkropp suggested that it would be helpful to use a phased approach and a checklist of steps that should be taken, for example, the presence and nature of upstream sources, literature values, atmospheric

deposition. Dan Odenweller described a monitoring/assessment approach in which cheap and quick methods are followed by progressively more intensive and precise methods, depending on the findings of each previous step. Both Ken Landau and Dr. Bernstein added that more detailed guidance such as checklists to aid coalition groups in implementing the MRP could be put in the order itself or in separate guidance documents that would be easier to revise and update.

IV. Steps in Source Identification—Examples Discussed

Dr. Bernstein identified a set of parameters to use as examples for stepping through the Weight of Evidence Ranking flow chart for source identification (Figure 2). These were chlorpyrifos, ammonia, lead, DDT/DDE, salinity, algae, and dissolved oxygen. These examples assume that the example parameters were already identified as a high priority.

CHLORPYRIFOS

Suggested steps include:

- Contact the agricultural commissioner to request pesticide use reports for a specific crop(s) and/or a specific period. There may or may not be a record of use for the pesticide being investigated. It is also important to recognize that the use reports are only a first step, are not all inclusive, and do not account for discharge patterns that have a large effect on the potential for downstream impact.
- Contact growers who grow the crop or use the pesticide to verify use patterns and discuss the problem and ways to address it. For example, most of the chlorpyrifos use is on a couple of specific crops within a well-defined time period, e.g., dormant spray and alfalfa.
- Verify that people comply with the regulatory requirements from DPR (in terms of applications).
- Determine the discharge pattern(s) for the period(s) of interest. Note that discharge can change daily and that it can be hard to pin sources down to individual growers.
- Surveys may be needed to help interpret the implications of the discharge patterns.
- Identify who has used it (if possible) and contact the specific growers. However, it may only be possible to identify users/sources to categorical levels.

LEAD

Suggested steps include;

- Determine whether lead is a high priority constituent by doing a rough estimate of inputs from all potential sources. Other criteria might include: not applied by agriculture, stems from legacy sources, large number of other potential sources.
- Use a desktop audit, combined with toxicity testing (see next bullet) to determine which beneficial uses are being impacted. Prioritize attention on where beneficial uses are being impacted.

- Based on the assumption that most lead is in the particulate phase, sediment toxicity tests, combined with sediment TIEs, could help distinguish, at least to generally, whether sediment toxicity is due to heavy metals such as lead or pyrethroids. If the majority of toxicity is due to pyrethroids, then this could provide a basis for identifying lead as a lower priority input.
- Test the assumption that most lead is particle bound, by obtain a sample using a pole to prevent disrupting the sediments in the creek bottom and filter the sample. Analyses for total and dissolved fractions would allow you to determine if the lead is sediment bound. However, we know that the partitioning of metals is complicated and that metals move back and forth from bound to dissolved phases.
- Determine whether sediment-bound lead is entering the system and moving downstream through the system or is simply being resuspended by high flows from sediments already in the system.
- If lead is entering the system, figure out where this is coming from, perhaps with lead isotope studies, but this would be very costly.
- Lead could be present from legacy applications. If so, there should be an "early out" in the process, unless erosion control practices useful for other constituents would also be useful for lead.

SALINITY

Suggested steps include:

- It is relatively easy to determine the source(s) of salinity. The incremental change due to agriculture can be estimated with a straightforward comparison of input vs. output levels.
- Evaluate the priority level for salinity.
- While it is easy to identify the source(s), BMPs may not be readily available for this issue.

Tracking salinity is easy, but the next steps are unclear. Max Stevenson commented that shallow groundwater in the Yolo County area is high in salinity (supported by decades of data) and is a major irrigation source in his area. In this area, the incremental addition from agriculture is not an issue. However, there are a few crops that do add lots of salt to the water and source control can work in these instances. In addition, salt can enter the system through irrigation water. A participant commented that this should be a low priority issue and he thinks that BMPs would not correct the problem. Dr. Karl Longley noted that BMPs do not generally exist for salinity and Bill Thomas stated that the solution might be to find ways to live with salinity in the short term, as opposed to pesticides where BMPs involve affirmative steps to remove the problem. Dr. Karl Longley then noted that on the east side of the San Joaquin Valley growers are focusing on source control (i.e., finding less salty sources). He also believes that there are steps that can be taken but they cost money. Dr. Longley believes that salinity should be addressed on a watershed basis and that this will take a long time, while other participants believe this is a Valley-wide issue, given how the Valley has been plumbed for

irrigation. Based on this discussion, there was some difference of opinion about the need for and/or appropriateness of an offramp for salinity.

DDT/DDE

Suggested steps include:

- Assume it is not currently being applied, since it is a legacy pesticide.
- It appears everywhere and does not appear to have highly localized sources. Use gradient analysis to test this assumption.
- DDT is generally associated with sediment and is detected when re-mobilized with sediment. Improve understanding of how DDT/DDE moves through the system, e.g., whether it is moving from fields to channels and how this happens. For example, flooding lands to drive salt further down in the soil brings in water with sediment loads that include DDT/DDE that remains on the fields after they dry out.
- Conduct simple mass balance modeling, as have been done for mercury in the San Francisco Bay area, to set some rough boundary conditions on the size of the problem and the potential for addressing it.
- Sediment control may be the best option to address this parameter and this provides an opportunity to deal at the same time with other sediment-related issues. Solutions should look at the entire drainage system, not just at the level of individual fields.

Dan Odenweller asked whether, in general, we could assume that there are not any current uses of DDT. Val Conner noted that fish and human health are the major issues related to DDT and she suggests that research on fish tissue would be a good strategy to address the issue. Marshall Lee noted that Dicofol (which is currently in use) contains trace amounts of DDT. However, another participant stated that their analyses have shown that current use is not nearly enough to explain the observed levels of DDT/DDE.

DISSOLVED OXYGEN

Suggested steps include:

- Determine the diurnal natural fluctuations of the site.
- This is often a BOD issue—may want to test BOD.
- A few potential causes of low DO include lack of flow, water temperature and BOD. It is expensive to determine the source(s) of BOD, these sources differ over space and time, and the impact of BOD is cumulative over time.

Claus Suverkropp suggested that the usual concept of source identification, as applied to chemicals, does not readily fit DO. This is because we are really talking about an indirect effect of several cumulative “sources”, including nutrient input, temperature, and BOD. For example, DO problems rarely occur in flowing water.

V. Additional Issues Discussed and Suggestions Offered

Margie Read stated that source identification and BMP implementation need not identify a specific person or field but this could be an improved practice that can

address problems more broadly. The Board is not interested in “finger pointing” but is emphasizing the goal of improved water quality. Ken Landau stated that he recognized the legal disconnect, or quandary, that stems from the fact that the waiver is a waiver of waste discharge requirements for individual farmers and not the coalitions themselves.

Thus, Ken Landau stated that it is the growers’ responsibility to be in compliance with the waiver, not the coalitions and individual farmers are the ones who need to implement BMPs.

Bill Thomas said that this was understood and wanted to know if the Regional Board will enforce the regulations if it is found that “Farmer Fred” is responsible for an identified problem. Dr. Karl Longley said that that would be a long, long journey. He then suggested that watershed-wide plans that address all water quality issues (including urban, agriculture, industry) would be more efficient than the current processes, but that he does not see an alternative at present to the coalitions. Val Connor agreed that the current approach is not efficient and suggested that we should consider cutting money from baseline studies and monitoring and reallocate funds to special studies to address overall issues. Dr. Karl Longley said that he could not agree more and that this should include moving upstream to improve our understanding of sources.

A process for identifying beneficial uses is being developed—we need to find a name for the process. It should be identified in the MRP. Where the narrative objective applies, rather than a numeric objective, the Basin Plan's policy is being used to implement the narrative objective. Both numeric objectives and limits determined through implementation of the narrative objective are being used as water quality trigger limits. During the time that it will take to work through identification of beneficial uses, water quality still needs to be protected.

A question was raised to Regional Board staff regarding what kind of approach the program will follow for the evaluation of valid studies for Basin Plan narrative interpretation. Is this approach going to follow TMDL process?

A participant stated that he thinks there is not a holistic approach to the water quality issues. The sort of multiple lines of evidence (MLOE) approach being adopted by the State Water Board for sediment objectives in coastal bays and estuaries is not applicable at present to the coalitions’ efforts. All lines of evidence (toxicity, chemistry, organisms) are being looked at individually. However, there was general agreement that a MLOE approach would be very useful for prioritizing issues and locations for further study or attention.

VI. Next Steps

The triggers focus group will hold a conference call to develop revised language that incorporates changes and additions to the MRP language based on concepts from this meeting.

The Regional Board staff will identify the next TIC Meeting date and notify stakeholders and interested parties. The Regional Board will compile and distribute summary notes of today's TIC meeting.

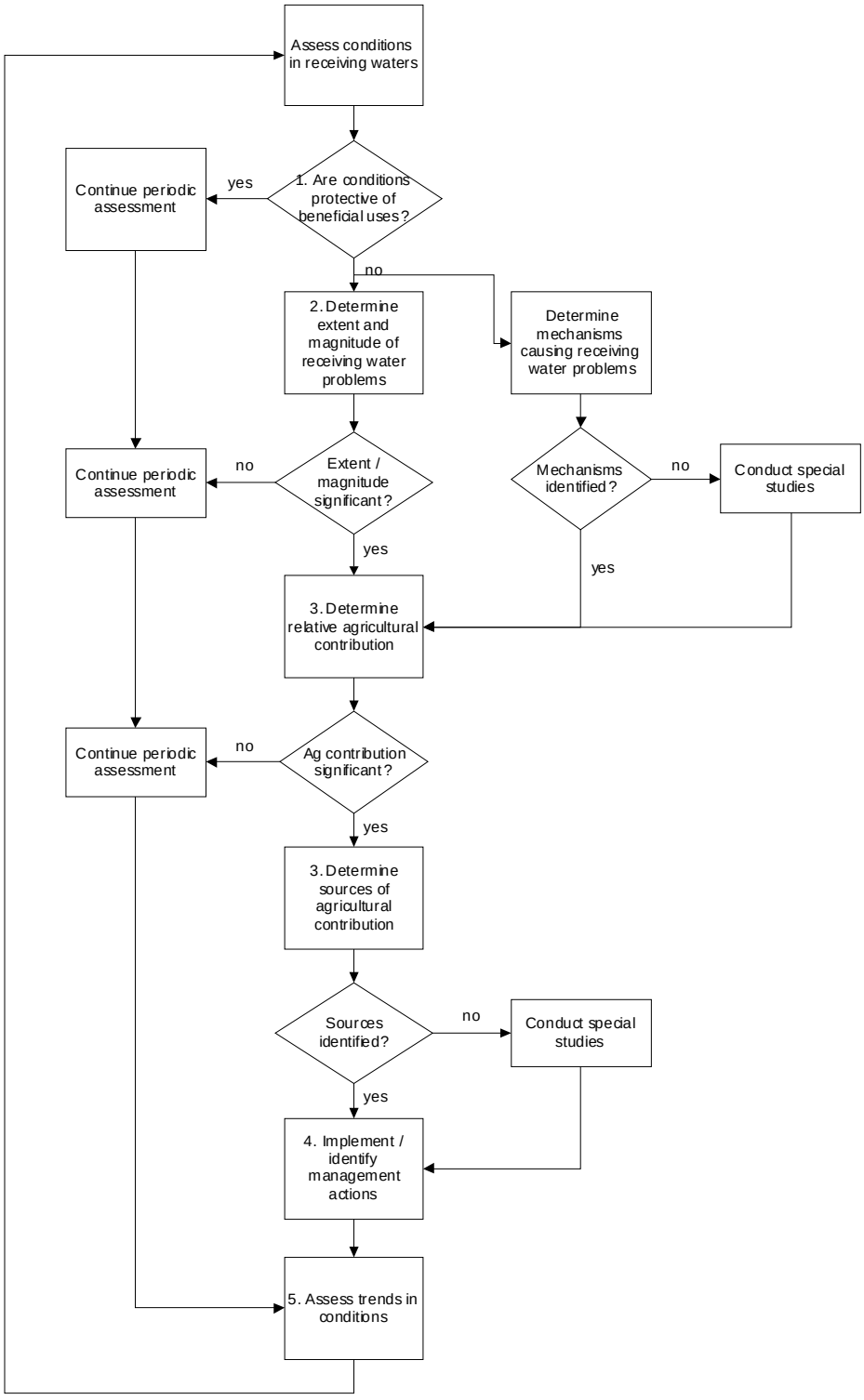

Figure 1. Overview of the functional relationships among the five management questions. The answer to each question provides the basis for developing the monitoring design to answer the next. Specific monitoring programs may have addressed questions in parallel or out of sequence, depending on available knowledge and specific information needs. Thus, the process may be entered at any point, depending on the degree of current knowledge.